



# DECUS

## PROGRAM LIBRARY

DECUS NO.

8-376

TITLE

FIELD 1 SYMBOL TABLE STORAGE FOR PALD  
(DEC-D8-ASAA-LA)

AUTHOR

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COMPANY

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DATE

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SOURCE LANGUAGE

PAL

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## FIELD 1 SYMBOL TABLE STORAGE FOR PALD (DEC-D8-ASAA-LA)

DECUS Program Library Write-up

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PALD provides for storing symbols on the system device, when the number of symbols exceeds  $160_{10}$ . When using DECTape, assembly and listing time can be excessive, due to the delays involved in the symbol table search on the mag. tape.

If Field 1 is available, the DECTape delays can be eliminated by storing the symbol table in Field 1, reducing assembly and listing time considerably. The saving in time will depend on the number of external symbols which are generated by the program. For a program requiring three blocks of external symbols, the saving in assembly time (compared to a DECTape symbol table) was one half. The larger the symbol table, the more time will be saved. With a disc as system device, the time saving is not significant.

Twenty blocks (of  $200_8$  words) are reserved in Field 1 for the symbol table, replacing .SYM on the system device.

Later versions of PALD may require some changes to the overlay.





1	PALD	1
2	*OUT-S:BPAL	2
3	*	3
4	*IN-S:OPAL	4
5	*	5
6	*OPT-T	6
7		7
8		8
9		9
10	BLKPTR 5327	10
11	BLKTAB 5330	11
12	BLKTBS 5335	12
13	BUF 5304	13
14	BUFTOP 5333	14
15	GDSVRV 6200	15
16	C200 0147	16
17	ERR1 0077	17
18	FROM 0014	18
19	LNKPTR 5331	19
20	M1 0133	20
21	P12 0160	21
22	P1740 5334	22
23	P3 0156	23
24	P37 0143	24
25	P7400 0163	25
26	P7600 0146	26
27	READ 5360	27
28	SADR 0023	28
29	SDECOD 5200	29
30	SERROR 5261	30
31	SNIM 5332	31
32	SREAD 5264	32
33	SVIRTL 5221	33
34	SWRITE 5305	34
35	T0 0015	35
36	VADR 0022	36
37	WRITE 5367	37
38		38
39	/8K OVERLAY FOR PALD	39
40	/EXTERNAL SYMBOL TABLE STORED IN FIELD 1	40
41	/FROM PAGE 1 TO PAGE 20	41
42	FROM=14	42
43	T0=15	43
44	M1=133	44
45	P7400=163	45
46	P7600=146	46





			C200=147		
			BLKPTR=5327		
			BLKTAB=5330		
			LNKPTR=5331		
			SNUM=5332		
1			SDECODE=5200		1
2			ERR1=77		2
3			P12=160		3
4			BUFTOP=5333		4
5			SADR=23		5
6			VADR=22		6
7			P37=143		7
8			P1740=5334		8
9			P3=156		9
10			/		10
11			/		11
12			/		12
13			/		13
14			/		14
15			*5200		15
16	6200	5205	CDSVRV, JMP .+5	/JUMP .SYM SEARCH	16
17			/		17
18			/REPLACE PALD CODING WITH THE FOLLOWING		18
19			/		19
20			*5221		20
21	5221	1727	SVIRTL, TAD I BLKPTR	/RECORD PREVIOUS BLOCK	21
22	5222	3331	DCA LNKPTR		22
23	5223	1332	TAD SNUM		23
24	5224	1163	TAD P7400		24
25	5225	0334	AND P1740		25
26	5226	7112	CLL RTR		26
27	5227	7012	RTR		27
28	5230	7010	RAR		28
29	5231	1330	TAD BLKTAB		29
30	5232	3327	DCA BLKPTR		30
31			/		31
32	5233	1332	TAD SNUM		32
33	5234	0143	AND P37		33
34	5235	7001	IAC		34
35	5236	7106	CLL RTL		35
36	5237	7041	CIA		36
37	5240	7001	IAC		37
38	5241	1333	TAD BUFTOP		38
39	5242	3023	DCA SADR		39
40	5243	1023	TAD SADR		40
41	5244	1156	TAD P3		41
42	5245	3022	DCA VADR		42
43			/		43
44	5246	1727	TAD I BLKPTR	/IS NEXT BLOCK ZERO?	44
45	5247	7650	SNA CLA		45
46	5250	5261	JMP SERROR	/YES, EXCEEDS SYMBOL TABLE	46





5251	1727	TAD I BLKPTR	/IS BLOCK SAME AS LAST?	1
5252	7041	CIA		2
5253	1331	TAD LNKPTR	/PREVIOUS BLOCK	3
5254	7650	SNA CLA		4
5255	5600	JMP I SDECOD	/YES	5
5256	1727	TAD I BLKPTR	/NO, READ IN BLOCK	6
5257	4264	JMS SREAD		7
5260	5600	JMP I SDECOD	/NOW RETURN	8
/				
5261	1160	SERROR, TAD P12		9
5262	4477	JMS I ERR1		10
5263	5546	JMP I P7600		11
/				
/TO READ OR WRITE 200 WORDS FROM FIELD 1				12
/BLOCK (IN FIELD 1) TO BE READ MUST BE IN AC				13
/IF SNUM IS ZERO, WRITE				14
/				
5264	0000	SREAD, 0		15
5265	7041	CIA		16
5266	3331	DCA LNKPTR	/-BLOCK NUMBER	17
/PAGE STARTING ADDRESSES				18
5267	1147	TAD C200		19
5270	2331	ISZ LNKPTR		20
5271	5267	JMP .-2		21
5272	1133	TAD M1		22
5273	3014	DCA FROM	/AUTO INDEX	23
5274	1304	TAD BUF		24
5275	3015	DCA TO	/AUTO INDEX	25
/READ OR WRITE?				26
5276	1146	TAD P7600		27
5277	3331	DCA LNKPTR	/SET TO READ(WRITE) 200 WORDS	28
5300	1332	TAD SNUM	/ZERO FOR WRITE	29
5301	7650	SNA CLA		30
5302	5367	JMP WRITE		31
5303	5360	JMP READ		32
5304	5377	BUF, 5400-1		33
/				
*5305				34
5305	0000	SWRITE, 0		35
5306	3332	DCA SNUM	/SET TO WRITE	36
5307	1727	TAD I BLKPTR		37
5310	4264	JMS SREAD		38
5311	1311	TAD .		39
5312	3332	DCA SNUM	/RESET TO READ	40
5313	5705	JMP I SWRITE		41
/				
*5335				42
5335	0001	BLKTRS, 1	/BLOCKS USED FOR TABLE	43
5336	0002			44
5337	0003			45
5340	0004			46





	5341	0005		5		
	5342	0006		6		
	5343	0007		7		
	5344	0010		10		
	5345	0011		11		
1	5346	0012		12		
2	5347	0013		13		1
3	5350	0014		14		2
4	5351	0015		15		3
5	5352	0016		16		4
6	5353	0017		17		5
7	5354	0020		20		6
8	5355	0000		0		7
9	5356	0000		0		8
10	5357	0000		0	/ GUARD	9
11						10
12						11
13						12
14	5360	6211	READ,	CDF+10		13
15	5361	1414		TAD I FROM		14
16	5362	6201		CDF		15
17	5363	3415		DCA I TO		16
18	5364	2331		ISZ LNKPTR		17
19	5365	5360		JMP READ		18
20	5366	5664		JMP I SREAD		19
21						20
22	5367	1415	WRITE,	TAD I TO		21
23	5370	6211		CDF+10		22
24	5371	3414		DCA I FROM		23
25	5372	6201		CDF		24
26	5373	2331		ISZ LNKPTR		25
27	5374	5367		JMP WRITE		26
28	5375	5664		JMP I SREAD		27
29						28
30						29
31						30
						31







# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-406
TITLE	STATPAC REVISIONS FOR PDP-8/I AND TSS/8
AUTHOR	Dartmouth College, Revisions by Berkshire Community College Submitted by: Roger W. Strickland
COMPANY	Berkshire Community College Pittsfield, Massachusetts
DATE	December 29, 1970
SOURCE LANGUAGE	BASIC

### ATTENTION

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# STATPAC REVISIONS FOR PDP-8/I AND TSS/8

DECUS Program Library Write-up

DECUS NO. 8-406

## ABSTRACT

This package contains 11 programs from the original PDP-10 Dartmouth BASIC Statistical Package which have been revised for the PDP-8/I and TSS/8. The documentation consists of a description and listing of each of the programs.

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10 ' BERKSHIRE COMMUNITY COLLEGE USER LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT01***
40 ' MODIFIED: JULY 2 1970
90 '
100' B.C.C. LIBRARY PROGRAM NAME: STAT01
110'
120' DESCRIPTION--COMPUTES THE MEAN, VARIANCE, STANDARD DEVIATION,
130' AND THE STANDARD ERROR OF THE MEAN FOR ONE OR MORE
140' SETS OF DATA.
150'
160' SOURCE--UNKNOWN
170'
180' INSTRUCTIONS--THE DATA START IN LINE NUMBER 900 AND CONTINUE
190' NOT PAST LINE 909. THE NUMBER 999999 MUST BE PLACED AT
200' THE END OF THE LAST DATUM OF EACH SET. SAMPLE DATUM ARE IN LINE
210' 900.
220'
230'
240' * * * * * MAIN PROGRAM * * * * *
250'
260 READ X
270 IF X = 999999 THEN 320
280 LET S = S + X
290 LET S1 = S1 + X*X
300 LET N = N + 1
310 GO TO 260
320 LET M = S/N
330 LET V = (N*S1 - S*S)/N/(N-1)
340 LET S3 = SQR(V)
350 LET S4 = SQR(V/N)
360 PRINT"NUMBER","SUM      SUM-OF-SQUARES","MEAN","VARIANCE"
370 PRINT N, S, S1, M, V
380 PRINT
390 LET Q = S3/M
400 PRINT "STD. DEV.", "STD. ERROR OF THE MEAN","COEFF. OF VARIATION"
410 PRINT S3, S4, "      ", Q
420 PRINT
430 PRINT
440 READ X
450 IF X = 999999 THEN 500
460 LET S=0
470 LET S1=0
480 LET N=0
490 GOTO 280
500 STOP
900 DATA 1,2,3,4,5,6,7,8,9,10,999999,4,3,9,15,21,6,999999
910 DATA 999999
920 END

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READY



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10 ' BERKSHIRE COMMUNITY COLLEGE USER LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT02***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C LIBRARY PROGRAM NAME: STAT02
110 '
120 ' DESCRIPTION--COMPUTES THE MEANS, VARIANCES, AND T-RATIO
130 ' FOR TWO GROUPS OF DATA, UNPAIRED. THIS PROGRAM ASSUMES THAT THE
140 ' TWO GROUPS HAVE THE SAME VARIANCE.
150 '
160 ' SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
170 '
180 ' INSTRUCTIONS--PUT DATA IN LINES 900 THROUGH 998.
190 ' END THE FIRST SERIES OF DATA WITH 999999 AND THEN TYPE
200 ' THE SECOND SERIES, AGAIN ENDING WITH 999999.
210 ' SAMPLE DATA ARE IN LINES 900 AND 910.
220 '
230 '
240 '
250 ' * * * * * MAIN PROGRAM * * * * *
260 DIM S(2),Z(2),N(2),M(2),V(2),D(2)
270 LET P = 1
280 LET S = 0
290 LET S2 = 0
300 LET N = 0
310 READ X
320 IF X = 999999 THEN 370
330 LET S = S + X
340 LET S2 = S2 + X*X
350 LET N = N + 1
360 GO TO 310
370 LET S(P) = S
380 LET Z(P) = S2
390 LET N(P) = N
400 IF P = 2 THEN 430
410 LET P = 2
420 GO TO 280
430 REM NOW WE PRINT THE ANSWERS
440 PRINT "GROUP", "NUMBER", "MEAN", "VARIANCE", "STD. DEV."
450 PRINT
460 FOR I = 1 TO 2
470 LET M(I) = S(I)/N(I)
480 LET V(I) = (N(I)*Z(I) - S(I)*S(I))/N(I)/(N(I) - 1)
490 LET D(I) = SQR(V(I))
500 PRINT I, N(I), M(I), V(I), D(I)
510 NEXT I
520 LET Q = V(1)*(N(1)-1)+V(2)*(N(2)-1)
530 LET Q = Q/(N(1) + N(2) - 2) * (1/N(1) + 1/N(2))
540 LET R = M(1) - M(2)
550 LET W = SQR(Q)
560 PRINT
570 PRINT "MEAN DIFF.", "VAR. DIFF.", "STD. DEV. DIFF."
580 PRINT R,Q,W
590 PRINT
600 PRINT "T RATIO", R/W, "ON"; N(1)+N(2)-2; "DEGREES OF FREEDOM."
610 STOP
900 DATA 160,160,140,190,999999
910 DATA 117,145,147,120,150,120,999999
999 END

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READY



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10 : BERKSHIRE COMMUNITY COLLEGE USED PROGRAM LIBRARY
20 : MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 : DARTMOUTH PROGRAM NAME: STAT03***
40 : MODIFIED: JULY 2 1970
90 :
100 : B.C.C. LIBRARY PROGRAM NAME: STAT03
110 :
120 : DESCRIPTION--COMPUTES THE MEANS, VARIANCES, AND T-RATIO
130 : FOR TWO GROUPS OF UNPAIRED DATA. THIS PROGRAM ASSUMES THAT THE
140 : GROUPS MAY HAVE UNEQUAL VARIANCES.
150 :
160 : SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
170 :
180 : INSTRUCTIONS--PUT DATA IN LINE 900 AND FOLLOWING.
190 : MAKE SURE THE DATA LINE NUMBERS DO NOT EXCEED 998.
200 : END THE FIRST SERIES OF DATA WITH 999999, AND THEN
210 : TYPE IN THE SECOND SERIES, AGAIN ENDING WITH 999999.
220 : SAMPLE DATA ARE IN LINES 900 AND 910.
230 :
240 :
250 : * * * * * MAIN PROGRAM * * * * *
260 DIM S(2),Z(2),N(2),M(2),V(2),D(2)
270 LET P = 1
280 LET S = 0
290 LET S2 = 0
300 LET N = 0
310 READ X
320 IF X = 999999 THEN 370
330 LET S = S + X
340 LET S2 = S2 + X*X
350 LET N = N + 1
360 GO TO 310
370 LET S(P) = S
380 LET Z(P) = S2
390 LET N(P) = N
400 IF P = 2 THEN 430
410 LET P = 2
420 GO TO 280
430 REM NOW WE PRINT THE ANSWERS
440 PRINT "GROUP", "NUMBER", "MEAN", "VARIANCE", "STD. DEV."
450 PRINT
460 FOR I = 1 TO 2
470 LET M(I) = S(I)/N(I)
480 LET V(I) = (N(I)*Z(I) - S(I)*S(I))/N(I)/(N(I) - 1)
490 LET D(I) = SQR(V(I))
500 PRINT I, N(I), M(I), V(I), D(I)
510 NEXT I
520 LET Q = V(1) / N(1) + V(2) / N(2)
530 LET W = SQR(Q)
540 LET R = M(1) - M(2)
550 LET K = V(1) / N(1) / Q
560 LET D = 1/(K*K/(N(1) - 1) + (1-K)*(1-K)/(N(2) - 1))
570 PRINT
580 PRINT "MEAN DIFF.", "VAR. DIFF.", "STD. DEV. DIFF."
590 PRINT R, Q, W
600 PRINT
610 PRINT "T RATIO", R/W, "ON"; D;"DEGREES OF FREEDOM."
620 STOP
900 DATA 160, 160, 140, 190, 999999
910 DATA 117, 145, 147, 120, 150, 120, 999999
999 END

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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT04***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT04
110 '
120 ' DESCRIPTION--COMPUTES CHI SQUARE STATISTICS FOR
130 ' 2 BY 2 CONTINGENCY TABLES.
140 '
150 ' SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
160 '
170 ' INSTRUCTIONS--DATA IS PUT IN LINE 900 AND FOLLOWING.
180 ' ENTER THE TABLES IN NORMAL ORDER WITH FOUR ENTRIES OF
190 ' TABLE 1 FIRST, THEN THE 4 ENTRIES FOR TABLE 2, ETC.
200 ' DATA LINE NUMBERS SHOULD NOT EXCEED 998. SAMPLE DATA ARE
210 ' IN LINE 900.
220 '
230 '
240 ' * * * * * MAIN PROGRAM * * * * *
250 '
260 PRINT "TABLE", "      ", "CHI SQUARE"
270 PRINT
280 READ A, B, C, D
290 LET N = A + B + C + D
300 LET E = A*D - B*C
310 LET E=ABS(E)
320 LET F = (E - N / 2 )
330 LET G = N * F * F
340 LET R1 = A + B
350 LET R2 = N - R1
360 LET C1 = A + C
370 LET C2 = N - C1
380 LET X = G / R1 / R2 / C1 / C2
390 PRINT A, B
400 PRINT C, D, X
410 GO TO 270
900 DATA 6, 0, 2, 6, 6, 0, 1, 3
999 END

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READY

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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT08***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT08
110 '
120 ' DESCRIPTION--COMPARES TWO GROUPS OF DATA USING THE MEDIAN TEST.
130 '
140 ' SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
150 '
160 ' INSTRUCTIONS--PUT DATA IN LINE 900 AND FOLLOWING.
170 ' THE FIRST DATUM IS THE NUMBER OF ENTRIES IN THE FIRST
180 ' GROUP, THEN ENTER THE NUMBER OF ENTRIES IN THE SECOND GROUP,
190 ' THEN THE FIRST GROUP ITSELF IS ENTERED, AND THEN THE SECOND GROUP.
200 ' THE PROGRAM PRINTS OUT THE CHI SQUARE STATISTIC OF A 2 BY 2 TABLE
210 ' ON 1 DEGREE OF FREEDOM. DATA SHOULD NOT EXCEED LINE 998.
220 ' SAMPLE DATA ARE IN LINE 900.
230 '
240 '
250 ' * * * * * MAIN PROGRAM * * * * *
260 '
265 DIM A(100)
270 READ M, N
280 LET M1 = M + N
290 LET M2 = INT( M1/2 )
295 FOR Z1= 1 TO M1
300 READ A(Z1)
305 NEXT Z1
310 LET L = 1
320 LET U = M
330 GOSUB 630
340 LET L = M + 1
350 LET U = M1
360 GOSUB 630
365 LET X = 0
370 LET Y = 0
380 LET I = 1
390 LET J = M + 1
400 FOR K = 1 TO M2
410 IF A(I) < A(J) THEN 470
420 LET Y = Y + 1
430 LET J = J + 1
440 IF J <= M1 THEN 520
450 LET X = M2 - Y
460 GO TO 530
470 LET X = X + 1
480 LET I = I + 1
490 IF I <= M THEN 520
500 LET Y = M2 - X
510 GO TO 530
520 NEXT K
530 LET U = M - X
540 LET V = N - Y
550 LET Z = X*V - Y*U
560 LET T = M1*( ABS(Z) - M1/2 ) + 2
570 LET C2 = T / M / N / M2 / (M1 - M2)
580 PRINT "TWO SAMPLE MEDIAN TEST."
590 PRINT "GROUP 1 "; X; U
600 PRINT "GROUP 2 "; Y; V
610 PRINT "CHI-SQUARE = "; C2
620 STOP
630 FOR I = 1 TO U - L

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640     LET X = A(L)
650     LET Q = L
660     FOR J = L + 1 TO U - I + 1
670         IF X >= A(J) THEN 700
680         LET X = A(J)
690         LET Q = J
700     NEXT J
705 LET J = U-I+1 'THIS STATEMENT PUT IN TSS/8 BECAUSE OF BUG IN BASIC
710     IF J = Q THEN 740
720     LET A(Q) = A(J)
730     LET A(J) = X
740 NEXT I
750 RETURN
900 DATA 4, 6, 160, 160, 140, 190, 117, 145, 147, 120, 150, 120
999 END

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READY

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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT9X***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT9X
110 '
120 ' DESCRIPTION--COMPUTES THE SLOPE AND OTHER STATISTICS FOR A
130 ' LINEAR REGRESSION WITH SEVERAL Y VALUES FOR EACH X VALUE.
140 '
150 ' SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
160 '
170 ' INSTRUCTIONS--PUT DATA STARTING IN LINE 900.
180 ' FIRST DATA IS K, THE NUMBER OF DIFFERENT X-VALUES. THEN
190 ' FOR EACH OF THE K GROUPS-ENTER THE NUMBER IN THAT GROUP,
200 ' THEN THE COMMON X-VALUE, THEN THE Y-VALUES FOR THAT GROUP.
210 ' SAMPLE DATA ARE IN LINES 900-950.
220 '
230 '
240 ' * * * * * MAIN PROGRAM * * * * *
250 READ K
260 FOR J = 1 TO K
270   READ NO
280   LET N=N+NO
290   READ X
300   FOR I = 1 TO NO
310     READ Y
320     LET X1 = X1 + X
330     LET Y1 = Y1 + Y
340     LET X2 = X2 + X*X
350     LET Y2 = Y2 + Y*Y
360     LET Z = Z + X*Y
370   NEXT I
380 NEXT J
390 LET S1 = N*X2 - X1*X1
400 LET S2 = N*Z - X1*Y1
410 LET B = S2/S1
420 LET Y3 = Y1/N
430 LET X3 = X1/N
440 LET B1 = Y3 - B*X3
450 LET N1 = N - 1
460 LET N2 = N1 - 1
470 LET S3 = (Y2 - Y1*Y3 - B*S2/N)
480 LET S4 = S3/N2
490 PRINT "NUMBER = "; N, "SLOPE = "; B
500 PRINT "MEAN OF X = "; X1/N, " OF Y = "; Y1/N
510 PRINT "Y-INTERCEPT = "B1
520 PRINT "SUM-OF-SQUARES", "TOTAL",Y2
530 PRINT " ", "MEAN ", Y3*Y1
540 PRINT " ", "SLOPE ", B*S2/N
550 PRINT " ", "RESIDUAL ", S3
560 PRINT "STANDARD DEVIATIONS"
570 PRINT " ", "X ", SQR(S1/N/N1)
580 PRINT " ", "Y ", SQR((Y2-Y1*Y3)/N1)
590 PRINT " ", "ERROR ", SQR(S4)
600 PRINT " ", "Y-BAR ", SQR(S4/N)
610 PRINT " ", "SLOPE ", SQR(S4/S1*N)
620 PRINT " ", "Y-INTER.", SQR(S4*(1/N + X3*X3/S1*N))
630 PRINT "F-RATIO FOR SLOPE = " B*S2/N/S4
640 STOP
900 DATA 5
910 DATA 3, 4, 6, 8, 7
920 DATA 2, 7, 1, 3

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930 DATA 5, 6, 1, 2, 3, 4, 5  
940 DATA 1, 1, 2  
950 DATA 4, 5, 2, 4, 6, 8, 10  
999 END

READY

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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT11***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT11
110 '
120 ' DESCRIPTION--COMPUTES THE SPEARMAN RANK CORRELATION COEFFICIENT
130 ' FOR TWO SERIES OF DATA.
140 '
150 ' SOURCE--THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
160 '
170 ' INSTRUCTIONS--PUT DATA IN LINE 900 AND FOLLOWING.
180 ' ENTER DATA IN THE FOLLOWING ORDER: FIRST THE COMMON LENGTH
190 ' OF EACH SERIES, THEN THE ELEMENTS OF THE SERIES BY GROUPS
200 ' THAT IS X1,Y1,X2,Y2,....ETC.
210 ' SAMPLE DATA ARE IN LINE 900.
220 '
230 '
240 ' * * * * * MAIN PROGRAM * * * * *
250 '
260   DIM A(100), B(100)
270   READ N
280   FOR I = 1 TO N
290     READ A(I), B(I)
300   NEXT I
310   FOR I = 1 TO N - 1
320     LET X = A(I)
330     LET Y = B(I)
340     LET Q = 1
350     FOR J = 2 TO N - I + 1
360       IF X >= A(J) THEN 400
370       LET X = A(J)
380       LET Y = B(J)
390       LET Q = J
400     NEXT J
410   LET J = N - I + 1
411   IF Q = J THEN 460
420     LET A(Q) = A(J)
430     LET A(J) = X
440     LET B(Q) = B(J)
450     LET B(J) = Y
460   NEXT I
470   REM NOW WE REPLACE THE ELEMENT BY ITS AVERAGE RANK
480   FOR I = 1 TO N
490     LET X = A(I)
500     FOR J = I + 1 TO N
510       IF X <> A(J) THEN 540
520     NEXT J
530     LET J = N + 1
540     LET Z = (J + I - 1)/2
550     FOR K = I TO J - 1
560       LET A(K) = Z
570     NEXT K
580     LET I = J - 1
590   NEXT I

```



```

600 IF P = 1 THEN 690
610 REM NOW WE INTERCHANGE A AND B AND SORT AGAIN.
620 FOR I = 1 TO N
630     LET T = A(I)
640     LET A(I) = B(I)
650     LET B(I) = T
660 NEXT I
670 LET P = 1
680 GO TO 310
690 REM NOW WE START COMPUTING THE CORRELATION COEFFICIENT.
700 FOR I = 1 TO N
710     LET S1 = S1 + A(I) * A(I)
720     LET S2 = S2 + B(I) * B(I)
730     LET S3 = S3 + A(I) * B(I)
740 NEXT I
750 LET S = N * N * (N+1) * (N+1) / 4
760 LET D1 = N * S1 - S
770 LET D2 = N * S2 - S
780 LET D = D1 * D2
790 IF D <> 0 THEN 820
800 LET R = 0
810 GO TO 830
820 LET R = (N * S3 - S) / SQR(D)
830 PRINT "SPEARMAN RANK CORRELATION COEFFICIENT"
840 PRINT "  R = "; R
850 STOP
900 DATA 5, 480, 56, 500, 61, 520, 78, 540, 71, 56, 82
910 END

```

READY

```

10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT20***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT20
110 REM JUNE 11, 1970
120 REM DESCRIPTION-- MULTIPLE LINEAR REGRESSION ACCORDING TO
130 REM EFRØYSON'S ALGORITHM
140 REM
150 REM SOURCE-- RALSTON AND WILF,"MATHEMATICAL METHODS FOR DIGITAL
160 REM COMPUTERS",P.191
165 REM PROGRAMMED BY THOMAS E. KURTZ, KIEWIT COMPUTATION CENTER
170 REM
180 REM INSTRUCTIONS--ENTER DATA STARTING IN LINE 1610.
190 REM FIRST DATA IS N, THE NUMBER OF INDEPENDENT VARIABLES, THEN
200 REM P, THE NUMBER OF DEPENDENT VARIABLES, THEN M, THE NUMBER
210 REM OF DATA SETS, THEN F1, THE VALUE OF F FOR ENTERING
220 REM A VARIABLE, AND THEN F2, THE VALUE OF F FOR REMOVING A
225 REM VARIABLE. THEN ENTER THE DATA BY SETS, INDEPENDENT VARIABLES
230 REM BEFORE DEPENDENT VARIABLES. IF M>50 OR P>7 OR N>8 THE
240 REM DIM STATEMENTS IN LINE 300 SHOULD BE CHANGED. SAMPLE DATA
250 REM ARE IN LINES 1610-1760.
260 REM BE SURE TO REMOVE SAMPLE DATA BEFORE RUNNING PROGRAM.
270 REM
280 REM * * * * * MAIN PROGRAM * * * * *
290 REM
300 DIM S(6,6)
301 DIM A(20,4)
302 DIM M(8),D(8),B(7),E(7)
310 READ N, P, M, F1, F2
320 LET T1 = 1E-6
330 LET N1 = N + P
340 LET N2 = N1 + N
350 LET K = 1
360 LET D1 = M - 1
370 REM MAT READ A(M,N1)
371 FOR I9 = 1 TO M
372 FOR I8 = 1 TO N1
373 READ A(I9,I8)
375 NEXT I8
376 NEXT I9
380 FOR I = 1 TO M
390 LET A(I,0)=1
400 NEXT I
410 PRINT "MEANS "
420 FOR I = 0 TO N1
430 FOR J = 1 TO N1
440 LET S = 0
450 FOR L = 1 TO M
460 LET S = S + A(L,I) * A(L,J)
470 NEXT L
480 LET S(I,J) = S
490 NEXT J
500 LET M(I) = S(0,I) / S(0,0)
510 IF I = 0 THEN 530
520 PRINT M(I),
530 NEXT I
540 PRINT
550 PRINT
560 PRINT "STANDARD DEVIATIONS"
570 LET M1 = M * D1
580 FOR I = 1 TO N1

```



```

590     FOR J = 1 TO N1
600         LET S(I,J) = ( M*S(I,J) - S(O,I)*S(O,J) )/M1
610     NEXT J
620     LET D(I) = SQR( S(I,I) )
630     PRINT D(I),
640 NEXT I
650     PRINT
660     PRINT
670     PRINT "CORRELATION COEFFICIENTS"
680     FOR I = 1 TO N2
690         FOR J = 1 TO N2
700             IF J > N1 THEN 740
710             LET S(I,J) = S(I,J) / D(I) / D(J)
720             LET S(J,I) = S(I,J)
730             GO TO 800
740             IF I <> J - N1 THEN 780
750             LET S(I,J) = 1
760             LET S(J,I) = -1
770 GO TO 800
780             LET S(I,J) = 0
790             LET S(J,I) = 0
800         NEXT J
810     NEXT I
820     FOR I = 1 TO N1
830         FOR J = 1 TO N1
840             PRINT S(I,J),
850         NEXT J
860         PRINT
870         PRINT
880     NEXT I
890     PRINT
900     LET K1 = K + N
910     PRINT "DEPENDENT VARIABLE",K
920     FOR I = 1 TO N
930         LET B(I) = 0
940     NEXT I
950     LET S8 = D(K1) * SQR( S(K1,K1) / D1 )
960 LET V1 = 1E35
970     LET V2 = 0
980     LET N3 = 0
990     LET N4 = 0
1000    FOR I = 1 TO N
1010        IF ABS( S(I,I) ) <= T1 THEN 1140
1020        LET V0 = S(I,K1) * S(K1,I) / S(I,I)
1030 LET E9= SGN(V0)+2
1031 IF E9 = 1 THEN 1080
1032 IF E9 = 2 THEN 1140
1033 IF E9 = 3 THEN 1040
1040        IF V0 <= V2 THEN 1140
1050        LET V2 = V0
1060        LET N4 = I
1070        GO TO 1140
1080        LET I1 = I + N1
1090        LET B(I) = S(I1,K1) * D(K1) / D(I)
1100        LET E(I) = S8 / D(I) * SQR( S(I1,I1) )
1110        IF ABS( V0 ) >= ABS( V1 ) THEN 1140
1120        LET V1 = V0
1130        LET N3 = I
1140    NEXT I
1150    LET S = 0
1160    FOR I = 1 TO N
1170        LET S = S + B(I) * M(I)
1180    NEXT I

```



```

1190 LET B(0) = M(K1) - S
1200 PRINT "INDEX ", "B ", "STD. DEV.", "T-RATIO "
1210 PRINT 0, B(0)
1220 FOR I = 1 TO N
1230 IF B(I) = 0 THEN 1250
1240 PRINT I, B(I), E(I), B(I) / E(I)
1250 NEXT I
1260 PRINT "STANDARD ERROR OF Y ", S8 * SQR(M-1)
1270 PRINT
1280 LET F = ABS(V1) * D1 / S(K1,K1)
1290 IF F < F2 THEN 1360
1300 LET F = V2 * (D1 - 1) / ( S(K1,K1) - V2 )
1310 IF F <= F1 THEN 1570
1320 LET Q = N4
1330 LET D1 = D1 - 1
1340 PRINT "VARIABLE ENTERING ", Q
1350 GO TO 1390
1360 LET Q = N3
1370 LET D1 = D1 + 1
1380 PRINT "VARIABLE LEAVING ", Q
1390 PRINT "F-LEVEL ", F
1400 LET Y = 1 / S(Q,Q)
1410 FOR J = 1 TO N2
1420 LET S(Q,J) = S(Q,J) * Y
1430 NEXT J
1440 LET Y = -Y
1450 FOR I = 1 TO N2
1460 IF I = Q THEN 1540
1470 LET X = -S(I,Q)
1480 FOR J = 1 TO N2
1490 IF J = Q THEN 1520
1500 LET S(I,J) = S(I,J) + X * S(Q,J)
1510 GO TO 1530
1520 LET S(I,J) = S(I,J) * Y
1530 NEXT J
1540 NEXT I
1550 LET S(Q,Q) = -Y
1560 GO TO 950
1570 LET K = K + 1
1580 IF K <= P THEN 900
1590 PRINT " ***** END OF PROBLEM *****"
1600 STOP
1610 DATA 3,1,9,2.5,2.5
1620 DATA 24769,34181,35516,29566
1630 DATA 34181,35516,29566,37009
1640 DATA 35516,29566,37009,34542
1650 DATA 29
566,37009,34542,41485
1660 DATA 37009,34542,41485,49972
1670 DATA 34542,41485,49972,53944
1680 DATA 41485,49972,53944,47062
1690 DATA 49972,53944,47062,47284
1700 DATA 53944,47062,47284,57765
1710 DATA 1, 1, 1, 1
1720 DATA 3,4
1730 DATA 2,2,1,0
1740 DATA 1,3,4
1750 DATA 3,3,0,1
1755 DATA 1,2,3,4
1760 DATA 4,1,0,0
1999 END

```



## STAT21

### MULTIPLE LINEAR REGRESSION - FANCY OUTPUT

DESCRIPTION - Computes one or more multiple linear regressions on a batch of data.

INSTRUCTION - Place data in line 1940 and following. First data is N (number of data sets or observations), then V (number of variables in data batch), then G (number of regressions to be performed). Then enter the data by the data set, that is enter first the values for all variables at observation 1, then the values for variables at observation 2, etc. Variables may be entered in any order, but the order must be the same for each data set. The position of a variable in entering the data is the index of the variables. Thus, if there are four variables entered in the order X, Y, Z, W, the index of Z is 3. Next, for each regression enter (in order) H (the number of the regression), then K (total number of independent variables in the regression), then P1 (enter 1 if you want the residuals printed out, otherwise enter 0), P2 (enter 1 if you want the residuals printed out, otherwise enter 0), and then enter the indexes of the independent variables followed by the index of the dependent variable. If  $N > 9$  or  $V > 4$ , then the DIM statements in line 430 and 440 must be changed. Sample data are in lines 1940 through 1992. Be sure to remove the sample data before running the program.



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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: STAT21***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: STAT21
110 REM 5/27/70
120 REM
130 REM DESCRIPTION-- COMPUTES ONE OR MORE MULTIPLE LINEAR
140 REM REGRESSIONS ON A BATCH OF DATA.
145 REM
150 REM SOURCE--REVISED 11/16/67 BY PROF. GERALD CHILDS.
160 REM
170 REM INSTRUCTIONS--PLACE DATA IN LINE 1960 AND FOLLOWING.
180 REM FIRST DATA IS N (NUMBER OF DATA SETS OR OBSERVATIONS),
190 REM THEN V (NUMBER OF VARIABLES IN DATA BATCH), THEN G
200 REM (NUMBER OF REGRESSIONS TO BE PERFORMED), THEN ENTER THE
210 REM DATA BY THE DATA SET, THAT IS ENTER FIRST THE VALUES FOR
220 REM ALL VARIABLES AT OBSERVATION 1, THEN THE VALUES FOR THE
230 REM VARIABLES FOR OBSERVATION 2, ETC. VARIABLES MAY BE
240 REM ENTERED IN ANY ORDER, BUT THE ORDER MUST BE THE SAME FOR EACH
250 REM DATA SET. THE POSITION OF A VARIABLE IN ENTERING THE DATA IS
260 REM THE INDEX OF THE VARIABLE. THUS, IF THERE ARE 4 VARIABLES
270 REM ENTERED IN ORDER X,Y,Z,W THE INDEX OF Z IS 3. NEXT,
280 REM FOR EACH REGRESSION ENTER (IN ORDER) H (THE NUMBER OF THE
290 REM REGRESSION), THEN K (TOTAL NUMBER OF INDEPENDENT VARIABLES
420 REM * * * * * MAIN PROGRAM * * * * *
430 DIM X(4,4),A(4,4),D(9,4),Y(4),M(4),S(4)
440 DIM T(4),B(4),U(4,4),R(4,4),C(4,4),Q(9),E(4)
450 READ N, V, G
451 REM MAT READ D(N,V)
452 FOR I = 1 TO N
454 FOR J = 1 TO V
456 READ D(I,J)
458 NEXT J
459 NEXT I
470 FOR I=1 TO N
480 LET D(I,0)=1
490 NEXT I
500 READ H, K, P1, P2
510 LET M = K + 1
514 REM MAT READ E(M)
515 FOR Z = 1 TO M
520 READ E(Z)
525 NEXT Z
530 PRINT "**REGRESSION NUMBER"H":DEPENDENT VARIABLE IS"E(M)
540 PRINT
550 IF H>1 THEN 700
560 FOR I=0 TO V
570 FOR J=0 TO V
580 LET X=0
590 FOR L=1 TO N
600 LET X=X+D(L,I)*D(L,J)
610 NEXT L
620 LET X(I,J)=X
630 LET C(I,J)=X
640 NEXT J
650 LET T(I)=X(0,I)/X(0,0)
660 LET B(I)=0
670 IF I=0 THEN 690
680 LET B(I)=SQR(X(I,I)/(N-1)-X(0,I)*X(0,I)/(N*(N-1)))
690 NEXT I
700 PRINT "INDEX", "MEANS", "STANDARD DEVIATIONS"

```



```

710 FOR I=1 TO M
720 LET M(I)=T(E(I))
730 LET S(I)=B(E(I))
740 PRINT E(I), M(I), S(I)
750 NEXT I
760 PRINT
770 PRINT
780 PRINT "CORRELATION COEFFICIENTS"
790 IF H>1 THEN 850
800 FOR I=1 TO V
810 FOR J=1 TO V
820 LET R(I,J)=(N*X(I,J)-X(O,I)*X(O,J))/(N*(N-1)*B(I)*B(J))
830 NEXT J
840 NEXT I
850 FOR I=1 TO M
860 FOR J=1 TO M
870 LET U(I,J)=R(E(I),E(J))
880 PRINT U(I,J),
890 NEXT J
900 PRINT
910 PRINT
920 NEXT I
930 PRINT
940 LET E(O)=0
950 FOR I=0 TO K
960 LET Y(I)=C(E(I),E(M))
970 FOR J=0 TO K
980 LET X(I,J)=C(E(I),E(J))
990 NEXT J
1000 NEXT I
1010 FOR I=0 TO K
1020 FOR J=0 TO K
1030 IF I<>J THEN 1060
1040 LET A(I,J)=1
1050 GO TO 1070
1060 LET A(I,J)=0
1070 NEXT J
1080 NEXT I
1090 FOR I=0 TO K
1100 IF X(I,I)<1E-6 THEN 1840
1110 LET Y(I)=Y(I)/X(I,I)
1120 FOR J=0 TO K
1130 LET A(I,J)=A(I,J)/X(I,I)
1140 IF J=I THEN 1160
1150 LET X(I,J)=X(I,J)/X(I,I)
1160 NEXT J
1170 LET X(I,I)=1
1180 FOR L=0 TO K
1190 IF L=I THEN 1270
1200 LET Y(L)=Y(L)-X(L,I)*Y(I)
1210 FOR J=0 TO K
1220 LET A(L,J)=A(L,J)-X(L,I)*A(I,J)
1230 IF J=I THEN 1250
1240 LET X(L,J)=X(L,J)-X(L,I)*X(I,J)
1250 NEXT J
1260 LET X(L,I)=0
1270 NEXT L
1280 NEXT I
1290 LET S6=C(E(M),E(M))

```

```

1300 FOR I=0 TO K
1310 LET S6=S6-Y(I)*C(E(I),E(M))
1320 NEXT I
1330 LET S7=S6/(N-M)
1340 LET R2=1-S7/(S(M)*S(M))
1350 LET R=SQR(R2)
1360 LET S8=SQR(S7)
1370 IF P1=0 THEN 1390
1380 PRINT "VARIANCE-COVARIANCE MATRIX"
1390 FOR I=0 TO K
1400 FOR J=0 TO K
1410 LET A(I,J)=A(I,J)*S7
1420 IF P1=0 THEN 1440
1430 PRINT A(I,J),
1440 NEXT J
1450 IF P1=0 THEN 1480
1460 PRINT
1470 PRINT
1480 NEXT I
1490 PRINT
1500 PRINT "INDEX", "B", "STD. ERROR", "T-RATIO"
1510 FOR I=0 TO K
1520 PRINT E(I), Y(I), SQR(A(I,I)), Y(I)/SQR(A(I,I))
1530 NEXT I
1540 PRINT
1550 PRINT "R-SQUARED=" R2, "R=" R
1560 PRINT
1570 PRINT "STAND. ERROR OF EST.=" S8, "D.F.=" (N-M)
1580 PRINT
1590 FOR I=1 TO N
1600 LET Z=D(I,E(M))-Y(0)
1610 FOR J=1 TO K
1620 LET Z=Z-Y(J)*D(I,E(J))
1630 NEXT J
1640 LET Q(I)=Z
1650 NEXT I
1660 LET W=0
1670 FOR I=2 TO N
1680 LET W=W+(Q(I)-Q(I-1))*(Q(I)-Q(I-1))
1690 NEXT I
1700 PRINT
1710 IF P2=0 THEN 1780
1720 PRINT "ACTUAL", "PREDICTED", "RESIDUAL"
1730 LET I = 0
1740 LET I = I + 1
1750 PRINT D(I,E(M)), D(I,E(M))-Q(I), Q(I)
1760 IF I = N THEN 1780
1770 GO TO 1740
1780 PRINT
1790 PRINT "DURBIN-WATSON STAT.=" W/S6
1800 IF H<G THEN 1820
1810 GO TO 1850
1820 PRINT
1830 GO TO 500
1840 PRINT "CORRELATION MATRIX BECOMING SINGULAR"
1850 PRINT
1860 PRINT " *****PROBLEM COMPLETED*****"
1870 STOP

```



1940 DATA 9,4,4  
1950 DATA 24769,34181,35516,29566  
1952 DATA 34181,35516,29566,37009  
1954 DATA 35516,29566,37009,34542  
1956 DATA  
29566,37009,34542,41485  
1958 DATA 37007,34542,41485,49972  
1960 DATA 9,4,4  
1961 DATA 24769, 34181,35516,29566  
1962 DATA 34181, 35516, 29566, 37009  
1963 DATA 35516,29566,37009,34542  
1964 DATA 29566,37009,34542,41485  
1965 DATA 37007,34542,41485,49972  
1966 DATA 34542,41485,49972,53944  
1967 DATA 41485,49972,53944,47062  
1968 DATA 49972, 53944, 47062,47284  
1969 DATA 53944,47062,47284,57765  
1970 DATA 1, 1, 1, 1  
1972 DATA 3,4  
1974 DATA 2,2,1,0  
1980 DATA 1,3,4  
1982 DATA 3,3,0,1  
1984 DATA 1,2,3,4  
1990 DATA 4,1,0,0  
1992 DATA 4,3  
2046 END

READY

```

1' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
2' MODIFIED VERSION OF DARTMOUTH STATISTICS PROGRAM
3' DARTMOUTH PROGRAM NAME: R-X-C***
4' MODIFIED: JULY 2 1970
5'
6' B.C.C. LIBRARY PROGRAM NAME: RXC
7'
8' DESCRIPTION-- ANALYSIS OF TABLE WITH R ROWS AND C COLUMNS
9'
10' SOURCE-- UNKNOWN
11'
12' INSTRUCTIONS-- TYPE RUN FOR INSTRUCTIONS.
13'
14'
15'
16'
70 READ T
75 DATA 8
80 DIM O(6),H(6)
85 DIM D(6,6),E(36),F(6,6),R(6),C(6),S(6,6)
90 DIM Q(6),U(6)
95 PRINT "HOW MANY ROWS DOES YOUR TABLE HAVE";
100 INPUT A
105 IF A>6 THEN 125
110 PRINT "COLUMNS";
115 INPUT B
120 IF B<=6 THEN 140
125 PRINT "THIS PROGRAM WILL NOT ACCOMMODATE A TABLE LARGER THAN"
130 PRINT "6 X 6. RE-ENTER NUMBER OF ROWS"
135 GO TO 100
140 PRINT "PLEASE TYPE IN YOUR DATA."
144 PRINT "ENTER TABLE BY ROW, ONE ENTRY PER LINE  "
145 FOR I = 1 TO A*B
146 INPUT E(I)
147 NEXT I
150 PRINT
155 PRINT
160 PRINT
165 PRINT
170 PRINT
175 LET N = A*B
180 IF N=(A*B) THEN 200
185 PRINT "YOU HAVE NOT ENTERED THE DATA CORRECTLY, BUT THAT'S"
190 PRINT "ALL RIGHT, CHIEF, JUST TRY AGAIN."
195 GO TO 145
200 PRINT "YOUR ";A;"BY ";B;"TABLE:"
205 PRINT
210 FOR I = 1 TO A
215 FOR J = 1 TO B
220 LET R(I) = 0
221 LET C(J) = 0
225 NEXT J
230 NEXT I
235 LET N = 0

```



```

240 FOR I = 1 TO A
245 FOR J = 1 TO B
250 LET D(I,J) = E((I-1)*B + J)
255 LET R(I) = R(I) + D(I,J)
260 LET C(J) = C(J) + D(I,J)
265 LET N = N + D(I,J)
270 PRINT D(I,J); TAB(J*T);
275 NEXT J
280 PRINT "": "R(I)
285 NEXT I
290 FOR I = 1 TO ((B*T + 13)/2)
295 PRINT ". ";
300 NEXT I
305 PRINT
310 FOR J = 1 TO B
315 PRINT C(J); TAB(J*T);
320 NEXT J
325 PRINT "": "N
330 PRINT
335 PRINT
340 PRINT "IS THIS DATA TABLE CORRECT";
345 INPUT A$
350 IF A$ = "NO" THEN 370
355 IF A$ = "YES" THEN 380
360 PRINT "WHAT";
365 GO TO 345
370 PRINT "THEN TYPE THE TABLE IN AGAIN"
375 GO TO 144
380 FOR I = 1 TO A
385 FOR J = 1 TO B
390 LET F(I,J) = R(I)*C(J)/N
395 LET S(I,J) = (D(I,J) - F(I,J))*2/F(I,J)
400 LET C2 = C2 + S(I,J)
405 NEXT J
410 NEXT I
415 LET G1 = C2
420 LET M = (A-1)*(B-1)
425 LET G = G1/M
430 LET P = 1
435 LET N9 = 1000
440 IF G < 1 THEN 465
445 LET A9 = M
450 LET B9 = N9
455 LET F = G
460 GO TO 480
465 LET A9 = N9
470 LET B9 = M
475 LET F = 1/G
480 LET A1 = 2/(9*A9)
485 LET B1 = 2/(9*B9)
490 LET Z = ABS((1-B1)*F*(.333333)-1+A1)
495 LET Z = Z/SQR(B1*F*(.666667)+A1)
500 IF B < 4 THEN 520
505 LET P=(1+Z*(.196854+Z*(.115194+Z*(.000344+Z*.019527))))+4
510 LET P = .5/P
515 GO TO 530
520 LET Z = Z*(1 + .08*Z+4/B+3)
525 GO TO 505
530 IF G < 1 THEN 540
535 GO TO 545

```



```

540 LET P = 1-P
545 LET P1 = INT(10000*P)/10000
550 IF P1 = 0 THEN 565
555 PRINT
560 GO TO 590
565 PRINT "THE SIGNIFICANCE LEVEL IS LESS THAN .0001. THIS IS "
570 PRINT "MUCH RARER THAN HEN'S TEETH IN RANDOM NUMBERS. "
575 PRINT "IN FACT, YOU MIGHT SAY RARER THAN RUM'S TEETH IN"
580 PRINT "RANDOM NUMBERS!"
585 GO TO 715
590 PRINT "THE SIGNIFICANCE LEVEL IS "; P1
595 PRINT
600 LET P = P1
605 IF P > .1 THEN 635
610 IF P > .05 THEN 685
615 IF P > .01 THEN 695
620 IF P > .001 THEN 705
625 PRINT "P < OR = .001. RARER THAN HEN'S TEETH IN RANDOM NUMBERS!"
630 GO TO 715
635 PRINT "P > .10. GET MORE CASES OR FORGET IT."
640 PRINT "DO YOU WANT MORE OUTPUT (PERCENTAGE TABLES, GAMMA, ETC.)";
645 INPUT AS
650 IF AS = "NO" THEN 1640
655 IF AS = "YES" THEN 670
660 PRINT "WHAT";
665 GO TO 645
670 PRINT "O.K. HERE GOES, BUT I WOULDN'T GIVE YOU TWO CENTS FOR IT."
675 GO TO 715
680 GO TO 715
685 PRINT ".10 >= P > .05. BORDERLINE. ONE IN 11 ISN'T ALL THAT RARE
690 GO TO 715
695 PRINT ".05 >= P > .01. MOST PEOPLE WOULD BUY 20 TO 1 ODDS."
700 GO TO 715
705 PRINT ".01 . = P > .001. YOU DON'T SEE MANY LIKE THAT WITH "
710 PRINT "RANDOM NUMBERS."
715 PRINT
720 PRINT
725 PRINT "WOULD YOU LIKE TO KNOW THE ABSOLUTE VALUE OF CHI-SQUARE";
730 INPUT AS
735 IF AS = "YES" THEN 755
740 IF AS = "NO" THEN 775
745 PRINT "COME ON, YES OR NO";
750 GO TO 730
755 PRINT
760 GOSUB 1665
765 PRINT TAB(9);
770 PRINT "CHI-SQUARE IS ";ABS(C2);"WITH ";(A-1)*(B-1);"D.F."
775 PRINT
780 PRINT
785 PRINT "DO YOU WANT THE PERCENTAGE TABLE";
790 INPUT AS
795 IF AS = "NO" THEN 1065
800 PRINT "TYPE 'H' IF YOU WANT IT DONE HORIZONTALLY, 'V' IF"
805 PRINT "VERTICALLY, AND 'B' IF BOTH."
810 INPUT AS
815 IF AS = "H" THEN 940
820 IF AS = "V" THEN 845
825 IF AS = "B" THEN 845
835 PRINT "WHAT";
840 GO TO 810

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845 PRINT "      VERTICAL PERCENTAGE TABLE"
850 PRINT
855 FOR I = 1 TO A
860 FOR J = 1 TO B
865 LET U1 = INT(1000*(D(I,J)/C(J))+.5)/10
870 LET U(J) = U(J) + U1
875 PRINT U1;TAB(J*T);
880 NEXT J
885 PRINT ": "; INT(1000*R(I)/N+.5)/10
890 LET V = V + INT(1000*R(I)/N + .5)/10
895 NEXT I
900 FOR I = 1 TO ((B*T + 13)/2)
905 PRINT ". ";
910 NEXT I
915 PRINT
920 FOR J = 1 TO B
925 PRINT U(J);"%";TAB(J*T);
930 NEXT J
935 GO TO 945
940 GO TO 960

945 PRINT ": ";V;"%"
950 PRINT
955 I
F AS = "V" THEN 1065
960 PRINT "      HORIZONTAL PERCENTAGE TABLE";
965 PRINT
970 FOR I = 1 TO A
975 FOR J = 1 TO B
980 LET T1 = INT(1000*(D(I,J)/R(I))+.5)/10
985 LET Q(I)=Q(I) + T1
990 PRINT T1;TAB(J*T);
995 NEXT J
1000 PRINT ": ";Q(I);%"
1005 NEXT I
1010 FOR I = 1 TO ((B*T + 13)/2)
1015 PRINT ". ";
1020 NEXT I
1025 PRINT
1030 FOR J = 1 TO B
1035 LET H5=INT(1000*(C(J)/N)+.5)/10
1040 LET W6 = W6 + H5
1045 PRINT H5; TAB(J*T);
1050 NEXT J
1055 PRINT ": "; W6; %"
1060 PRINT
1065 PRINT
1070 PRINT
1075 PRINT
1080 PRINT "DO YOU WANT THE EXPECTED CELL VALUES";
1085 INPUT AS
1090 IF AS = "NØ" THEN 1220
1095 IF AS = "YES" THEN 1110
1100 PRINT"WHAT";
1105 GO TO 1035
1110 PRINT
1115 PRINT TAB(5);"EXPECTED CELL VALUES"
1120 PRINT
1125 PRINT
1130 FOR I = 1 TO A
1135 FOR J = 1 TO B
1140 PRINT INT(100*F(I,J)+.5)/100;TAB(J*T);

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1145 LET H(I) = H(I) + INT(100*F(I,J) +.5)/100
1150 LET O(J) = O(J) + INT(100*F(I,J) +.5)/100
1155 NEXT J
1160 PRINT ": "; H(I)
1165 NEXT I
1170 FOR I = 1 TO ((B*T + 13)/2)
1175 PRINT ". ";
1180 NEXT I
1185 PRINT
1190 FOR J = 1 TO B
1195 PRINT O(J); TAB(J*T);
1200 NEXT J
1205 PRINT ": "; N
1210 PRINT
1215 PRINT
1220 PRINT
1225 PRINT
1230 PRINT "DO YOU WANT THE DIFFERENCE BETWEEN THE OBSERVED VALUE"
1235 PRINT "AND THE EXPECTED VALUE FOR EACH CELL";
1240 INPUT AS
1245 IF AS = "YES" THEN 1265
1250 IF AS = "NO" THEN 1355
1255 PRINT "WHAT";
1260 GO TO 1240
1265 PRINT
1270 PRINT
1275 PRINT
1280 PRINT
1285 PRINT "      OBSERVED VALUE MINUS EXPECTED VALUE"
1290 PRINT
1295 FOR I = 1 TO A
1300 FOR J = 1 TO B
1305 PRINT INT(100*(D(I,J)-F(I,J)))/100; TAB(J*T);
1310 NEXT J
1315 PRINT ": "
1320 NEXT I
1325 FOR I = 1 TO ((B*T + 7)/2)
1330 PRINT ". ";
1335 NEXT I
1340 PRINT
1345 PRINT TAB(B*T);": "
1350 PRINT
1355 PRINT
1360 PRINT
1365 PRINT
1370 PRINT
1375 PRINT "ARE BOTH THE ROW AND COLUMN SCALES ORDINAL";
1380 INPUT AS
1385 IF AS = "NO" THEN 1650
1390 IF AS = "YES" THEN 1405
1395 PRINT "WHAT";
1400 GO TO 1380
1405 PRINT "DO YOU WANT TO KNOW GAMMA";
1410 INPUT AS
1415 IF AS = "NO" THEN 1595
1420 IF AS = "YES" THEN 1440
1425 PRINT "WHAT DID YOU SAY"
1430 PRINT "PLEASE TYPE 'YES' OR 'NO'"
1435 GO TO 1410
1440 LET G1 = 0

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1445 FOR I = 1 TO (A - 1)
1450 FOR J = 1 TO (B - 1)
1455 LET X = 0
1460 FOR K = (I+1) TO A
1465 FOR L = (J+1) TO B
1470 LET X = X + D(K,L)
1475 NEXT L
1480 NEXT K
1485 LET G1 = G1 + (D(I,J)*X)
1490 NEXT J
1495 NEXT I
1500 LET G2 = 0
1505 FOR I = 1 TO (A-1)
1510 FOR J = B TO 2 STEP -1
1515 LET X = 0
1520 FOR K = (I+1) TO A
1525 FOR L = (J-1) TO 1 STEP -1
1530 LET X = X + D(K,L)
1535 NEXT L
1540 NEXT K
1545 LET G2 = G2 + (D(I,J)*X)
1550 NEXT J
1555 NEXT I
1560 LET G9 = (G1-G2) / (G1+G2)
1565 PRINT
1570 GOSUB 1665
1575 PRINT TAB(20);"GAMMA IS "; -INT(10000*G9)/10000
1580 PRINT
1585 PRINT
1590 GO TO 1600
1595 PRINT "TSK-TSK. NO INTELLECTUAL CURIOSITY."
1600 PRINT "ARE BOTH THE ROWS AND THE COLUMNS INTERVAL SCALES";
1605 INPUT AS
1610 IF AS = "NO" THEN 1660
1615 IF AS = "YES" THEN 1630
1620 PRINT "HOW'S THAT AGAIN? A SIMPLE 'YES' OR 'NO' WILL SUFFICE."
1625 GO TO 1605
1630 PRINT "HAVE YOU CONSIDERED PRODUCT MOMENT CORRELATIONS? I"
1635 PRINT "CAN'T DO THEM, BUT THERE ARE OTHER PROGRAMS WHICH CAN."
1640 PRINT "SO LONG. "
1645 STOP
1650 PRINT "THAT'S ALL I CAN DO FOR YOU. BYE-BYE."
1655 STOP
1660 PRINT "THEY AREN'T? THEN I'LL BE SHOIVING ALONG. GOOD-BY."
1665 FOR I = 0 TO 9
1670 PRINT " ";
1675 NEXT I
1685 REM
1690 REM
1695 RESTORE
1700 REM
1705 END

```

READY

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10 ' BERKSHIRE COMMUNITY COLLEGE USER PROGRAM LIBRARY
20 ' MODIFIED VERSION OF DARTMOUTH COLLEGE STATISTICS PROGRAM
30 ' DARTMOUTH PROGRAM NAME: CORREL***
40 ' MODIFIED: JULY 2 1970
90 '
100 ' B.C.C. LIBRARY PROGRAM NAME: CORREL
110 '
120 ' DESCRIPTION--COMPUTES A CORRELATION COEFFICIENT
130 '
140 ' SOURCE--UNKNOWN
150 '
160 ' INSTRUCTIONS--THE DATA CONSISTS OF N SETS OF NUMBERS.
170 ' EACH SET CONSISTS OF TWO ELEMENTS, X AND Y. N IS
180 ' ENTERED AS DATA IN LINE 900. IN LINE 910 AND FOLLOWING
190 ' ENTER DATA ALTERNATING X AND Y VALUES. SAMPLE DATA
200 ' ARE IN LINES 900-910.
210 '
220 ' * * * * * MAIN PROGRAM * * * * *
230 '
240 '
250 READ N
260 FOR I = 1 TO N
270 READ X, Y
280 LET S1 = S1 + X
290 LET S2 = S2 + Y
300 LET S3 = S3 + X*Y
310 LET S4 = S4 + X*X
320 LET S5 = S5 + Y*Y
330 NEXT I
340 PRINT "THE CORRELATION COEFFICIENT = ";
350 LET A = N*S3 - S1*S2
360 LET B = SQR((N*S4 - S1*2)*(N*S5 - S2*2))
370 LET A = INT(A/B*1000+.5)/1000
380 PRINT A
900 DATA 5
910 DATA 1,5,2,3,3,0,4,-5,5,-11
2046 END

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READY